

CLAIMS

What is Claimed is:

1. A computer system operable to provide backup copying of data without suspending an application program accessing the data, comprising:
 - 5 a storage device operable to store block data;
 - a backup storage device operable to store block data;
 - an intermediate block data container operable to store block data, wherein the computer system is operable to copy a data block from the storage device into the intermediate block data container and copy a data block from the intermediate block
 - 10 data container into the backup storage device during an online data backup process;
 - a file system driver operable to transmit a write request to write to the storage device;
 - a storage device driver program operable to read from the storage device and write to the storage device in block mode in response to the write request; and
 - 15 wherein the computer system is operable to manage the online data backup process by:
 - compiling a list of data storage blocks located in the storage device that are subject to the data backup process;
 - copying a data storage block to the backup storage device pursuant to the
 - 20 list of data storage blocks; and
 - suspending a write command that is directed to a data storage block that is subject to the data backup process but has not yet been copied, copying the data storage block that is the subject of a write command to the intermediate storage device, executing the write command and subsequently copying the data storage block from the
 - 25 intermediate storage device to the backup storage device.

2. The computer system of Claim 1, wherein the intermediate block data container is located in a memory location that is external to the computer file system.

3. The computer system of Claim 2, wherein the intermediate block data container is located in the storage device.

4. The computer system of Claim 3, wherein the intermediate block data
5 container is a separate partition of the storage device.

5. The computer system of Claim 1, wherein the intermediate block data container is a file within the file system.

10 6. The computer system of Claim 1, wherein the file system is further operable to write dirty pages to the storage device before initiating a data backup process.

7. The computer system of Claim 1, wherein the computer system is
15 operable to:

suspend a write command to the storage device during the data backup process if the intermediate block data container has reached a selected data capacity; and

copy a selected amount of data from the intermediate block data container to the backup storage device.

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8. The computer system of Claim 1, wherein the file system driver is operable to translate a write request addressed to a file located in the storage device received from a user process into one or more block write operations.

25 9. The computer system of Claim 1, wherein the file system driver operable to transmit a write request received from an operating system process.

10. The computer system of Claim 1, wherein the file system driver is operable to provide a data block number associated with a block in response to a write command directed to the data block during the online data backup process.

5 11. A method for providing an online data backup process for backing up data stored on a storage device associated with a computer system to a backup storage device, comprising the steps of:

providing an intermediate data container;

informing an operating system driver that the data is in a backup state;

10 compiling a list of data blocks located in the storage device that are subject to the online data backup process;

receiving a write operation directed to a listed data block subject to the online data backup process;

determining if the listed data block has been copied;

15 proceeding with write operation if the listed data block has been copied; and

suspending the write operation if the listed data block has not been copied, copying the listed data block to the intermediate block data container, and executing the write operation.

20 12. The method of Claim 11, further comprising the step of copying the listed data block from the intermediate block data container to a backup storage device.

13. The method of Claim 11, further comprising flagging a data block once the data block has been copied to the backup storage device.

25 14. The method of Claim 11, further comprising the step of informing the operating system driver that all of the data blocks subject to the online data backup process have been copied to the backup storage device.

15. The method of Claim 11, further comprising the step of receiving a data block number associated with the listed data block upon receiving a write operation directed to a listed data block.

5 16. The method of Claim 11, further comprising the step of writing a dirty page to the storage device before informing an operating system driver that the data is in a backup state.

10 17. The method of Claim 11, wherein the step of providing the intermediate block data container further comprises the step of providing a storage device external to the computer system.

15 18. The method of Claim 11, wherein the step of providing the intermediate block data container further comprises the step of providing a selected section of the storage device.

20 19. The method of Claim 11, wherein the step of providing the intermediate block data container further comprises the step of providing a selected file located in a file system associated with the computer system.

20 20. The method of Claim 11, wherein the step of suspending the write operation if the listed data block has not been copied, further comprises the steps of:

 determining whether the intermediate block data storage has reached a selected capacity; and

25 copying a selected portion of the intermediate block data storage to the backup storage device if the intermediate block data storage has reached the selected capacity.